To the Graduate Council:

I am submitting herewith a dissertation written by Kenneth L. Lichstein entitled "The Ecological Assessment of An Autistic Child." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Psychology.

Robert G. Wahler

Robert G. Wahler, Major Professor

We have read this dissertation
and recommend its acceptance:

Leo F. Droppleman

Wesley G. Morgan

Vey M. Rodgers

Accepted for the Council:

Hilton A. Smith

Vice Chancellor
Graduate Studies and Research

D

Thesis
Ph.D.
L537
Copy 2

THE ECOLOGICAL ASSESSMENT OF AN AUTISTIC CHILD

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee

Kenneth L. Lichstein

August 1976

1288335

ACKNOWLEDGEMENTS

I would like to express my appreciation to my committee members, Drs. Leo F. Droppleman, Wesley G. Morgan, Vey M. Nordquist, and, in particular, Robert G. Wahler, chairman, for their help and support. Special thanks are due Dr. Edward E. Cureton for his invaluable assistance with the statistical analyses.

I wish to thank my parents and my wife's parents for their encouragement and support, which has always been generously forthcoming.

I have profited from my children, Benjamin and Jeremy, by their sharing with me their contagious joy. Most of all, my wife Betty, deserves my gratitude for countless reasons.

ABSTRACT

The everyday behavior of an autistic child was studied in the natural environment without experimental manipulation. Observations were made of the child in three settings: the school in the morning, the school in the afternoon, and the home in the afternoon. Data was collected over approximately six months. Sixteen behaviors of the child and six behaviors of adults and peers were recorded.

A cluster analysis was performed to identify response classes within the behavioral structure of the child and to see if correlations existed between response and stimulus events. In addition, a number of empirical analyses were conducted.

The findings may be summarized as follows. While the child's undesirable behaviors were generally high and his appropriate behaviors were generally low, significant changes did occur in approximately 70% of the behaviors from setting to setting. Similar changes occurred within settings over time. This autistic child was far more flexible and diversified in his behavior than the classical notion of autistic children would predict. Although his responsiveness to adults was readily apparent, his nonrelatedness to other nonautistic children was rigid.

Several interesting themes appeared in the cluster analysis. A number of self-stimulatory behaviors were inversely correlated with a number of behaviors which denote an awareness and responsiveness to

environmental stimuli. In addition, adult attention was inversely correlated with a number of self-stimulatory behaviors. It was suggested that noncontingent adult attention interrupted the self-stimulatory sequences, causing their reduction and the accompanying increase in attentiveness to the environment. This conception was compatible with prior research on the overselectivity of autistic children's perception of the environment and the theory that the autistic child seeks to maintain an optimal level of physiological arousal.

A number of self-stimulatory behaviors correlated inversely with each other. The implication that planned reductions in one self-stimulatory behavior could cause unplanned increases in other self-stimulatory behaviors was discussed with regard to therapeutic interventions.

TABLE OF CONTENTS

CHAPTER		PAGE
I.	INTRODUCTION	1
	The Classical Description of Autism	1
	Behavioral Ecology	5
	Ecological Assessment	8
II.	METHOD	10
	Subject	10
	Settings	12
	Home	12
	School a.m.	13
	School p.m.	15
	Behavior Coding System	16
	Method of Observation	16
	Observers	19
	Reliability Analyses	20
	Data Analyses	21
III.	RESULTS	26
	Reliability	26
	Statistical Analysis	26
IV.	DISCUSSION	43
REFERENCES		56
APPENDIX		62
VITA		66

LIST OF TABLES

TABLE		PAGE
1.	Description of the Category Codes	17
2.	The Listing of Categories According to Their Admission into or Omission from the Cluster Analysis	23
3.	Percentage of Interobserver Reliability	27
4.	Range of Reliability Percentages	28
5.	Clusters	29
6.	Spearman Rank Correlation Coefficients	32
7.	Category Percent Occurrence per Session and *t* Tests of Differences between Means across Settings	33
8.	Category Percent Occurrence per Session in Each Half of Each Setting and *t* Tests of Differences between Means of Halves	34
9.	Pearson Product-Moment Correlations between Sa+ and the Pathological Behaviors	40
10.	The Grouping of Sessions According to the Highest and Lowest Frequencies of Sa+ and the Accompanying Fluctuations in S, OP, NI, and US	42
11.	Pearson Product-Moment Correlation Matrix for the Home Setting	63
12.	Pearson Product-Moment Correlation Matrix for the School a.m. Setting	64

TABLE PAGE

13. Pearson Product-Moment Correlation Matrix for the School p.m. Setting 65

CHAPTER I

INTRODUCTION

In 1943, Kanner isolated a particular set of symptoms which appeared in some disturbed children. A year later, this syndrome was given the name early infantile autism (Kanner, 1944). In the 30 odd years which have elapsed, research with this group of children has flourished. Some major contributions to a descriptive understanding of autism[1] will now be highlighted.

The Classical Description of Autism

In his original article, Kanner (1943) described 11 children who presented a variety of unusual symptoms. Some of these were eating problems, an extreme appreciation of music, unusual memory, delayed gross motor development, the mouthing of objects, IQ's as high as 140, and pronominal reversal, although all of these symptoms were not present in all of the children. There was, however, an autistic core which was characteristic and this included an inability to relate to people, an ability to relate purposefully and meaningfully to objects, an obsessive concern with maintaining an invariant environment, and difficulties in communication in the form of either mutism or echolalia.

---

[1]Presently, "autism" is a more generic, commonly accepted label than "early infantile autism," and hereafter, the author will employ the briefer term in referring to this class of children.

In general, "all of the children's activities and utterances are governed rigidly and consistently by the powerful desire for aloneness and sameness [p. 249]." Although, "the basic desire for aloneness and sameness has remained essentially unchanged [p. 249]," a gradual diminution in the rigidity of the autistic behaviors may commence at about five or six years of age.

In his ensuing publications, Kanner proceeded to reiterate and substantiate his original position. The "autistic aloneness" and "desire for the preservation of sameness" enjoyed particular prominence as the primary pathognomonic signs (Eisenberg & Kanner, 1956; Kanner, 1944, 1946, 1954).

Creak (1951) offered a description of autistic children which was very compatible with Kanner's. She referred to disturbed object relations, disturbed speech, and unaffected memory. Attention was also called to "spinners." These were autistic children who either themselves twirled around or would spin round objects. She concluded that "the cases which I have seen are consistently like those described by Kanner [p. 550]." At a later date, Creak (1963) provided nine basic criteria for diagnosing childhood schizophrenia:

1. gross and sustained impairment of emotional relationships with people;
2. apparent unawareness of his own personal identity to a degree inappropriate to his age;
3. pathological preoccupation with particular objects or certain characteristics of them, without regard to their accepted functions;
4. sustained resistance to change in the environment and a striving to maintain or restore sameness;
5. abnormal perceptual experience (in the absence of discernible organic abnormality);

6. acute, excessive and seemingly illogical anxiety as a frequent phenomenon;
7. speech either lost, or never acquired, or showing failure to develop beyond a level appropriate to an earlier age;
8. distortion in motility patterns;
9. a background of serious retardation in which islets of normal, near normal or exceptional intellectual function or skill may appear [p. 84].

Although she employed a different diagnostic label, this summation is similar in many respects to both her own and Kanner's earlier work on autism.

Mahler (1952) differentiated between autistic infantile psychosis and symbiotic infantile psychosis. The former is due to an "inherent autistic disturbance" revealed in a lack of "affective awareness" present from infancy. In the case history presented, the child had no language, startled in terror when touched by another person, and showed a marked preoccupation with the environment.

In the symbiotic infantile psychosis, there is a longer period of normal development before the disturbance develops. Also, in this syndrome there are active delusions and hallucinations denoting a higher level of conceptual and communication skills than are usually associated with autism. In a further comparison of the two, Mahler states that the autistic child seems content when left alone, unlike the symbiotic child. However, "any approach, any change in the environment, in the social setting, is resented as an irritating intrusion [p. 296]." Again, Mahler's autistic infantile psychosis is quite congruent with Kanner's and Creak's positions.

Learning theorists have also provided descriptions of autistic behavior. Phillips (1957) applied Miller's approach-avoidance conflict

theory and Ferster (1961) applied operant theory to the above task. However, these were mostly designed to reinterpret the existing understanding of autistic behavior and to provide a new etiological rationale, rather than challenge the established description. One exception did arise. It should be noted that in both of these papers brief mention was given to the fact that "normal" behavior does occasionally appear within the repertoire of autistic children.

More recent surveys on the general subject of autism confirmed the earlier impressions of autistic children, and offered little material alteration (Rimland, 1964; Rutter, 1968; Ward, 1970). Although there exists considerable disagreement over the etiology and treatment of autism, there is by now an entrenched, "classical notion" of the behavior of autistic children. Despite differences in the literature on this subject with regard to some particular aspects (DeMyer, Churchill, Pontius, & Gilkey, 1971), the classical notion is represented by a constellation of themes which finds acceptance across a broad spectrum of writers who diverge in other respects. It may be summarized as follows:

1. The autistic child is averse to, or at best oblivious of human interaction and will either ignore or escape such contact.
2. The autistic child engages in stereotypic, ritualistic behavior and similarly requires stereotypy and invariability in his environment. He is obsessively concerned with the maintenance of the above and will respond adversely to any disruption.

3. The autistic child exhibits seriously disturbed language development rendering him incapable of meaningful communication.
4. The above three views are considered inviolate characteristics of autistic children which are not subject to the influence of intra- or extra-individual factors.

This classical notion of autism has derived almost exclusively from three sources--office or institutional psychiatric examination and treatment, laboratory research, and parental reports. Our knowledge of the autistic child in his everyday life is an extrapolation from information gained under artificial circumstances. Barker and Wright (1955) considered this issue in more general terms: "In short, we know how people behave under the conditions of experiments and clinical procedures, but we know little about the distribution of these conditions outside of laboratories and clinics [p. 2]." Thus, what is known about the "normal" behavior of the autistic child is of a speculatory nature. If the ultimate goal of therapeutic intervention is the compatible operation of an individual in his natural environment, clinicians ought to be familiar with that environment and its influence on the individual.

Behavioral Ecology

The term "behavioral ecology" is a broad one. As it is used in this research, it refers to an emphasized appreciation of naturally occurring phenomena and the interactions between these (Willems, 1974).

The interest in "naturally occurring phenomena" stems from a long history of investigations into the relationships between the human being

and his environment. The early work of Hartshorne and May (1928) showed that children's self-evaluations of their moral code changed according to the setting in which the self-evaluations were made. They suggested that moral behavior was in part governed by environmental factors in contrast to the hypothesis that an internalized conscience directs our moral behavior independent of setting conditions (Freud, 1923/1961). The voluminous, naturalistic observations of Barker and Wright (1955) further developed the idea of setting specificity concerning a wide range of child behavior. This view is interestingly summarized by Barker (1968):

> The behavior of different children within the same region was often more similar than the behavior of any of them in different regions. The behavior of John and Joe was frequently more similar in a Boy Scout meeting than the behavior of John (or Joe) in a Scout meeting and in a Sunday school class [p. 152].

Barker (1969) continues this same thought elsewhere:

> We found that we could predict many aspects of children's behavior more adequately from knowledge of the behavior characteristics of the drugstores, arithmetic classes, and basketball games that they inhabited than from knowledge of the behavior tendencies of the particular children [p. 35].

The idea that behavior is situation specific has been supported by experimentation comparing the behavior of children in home and school settings (Wahler, 1969, 1975). Indeed, the fact that beneficial therapeutic effects produced with autistic children in one setting do not always carry over to other settings is a frequently encountered problem (Foxx & Azrin, 1973; Lovaas & Simmons, 1969; Merbaum, 1973). The view of behavioral ecology holds that increased knowledge of this

relationship between behavior and environment is essential to a comprehensive understanding of human behavior.

In more recent years, the investigation of "naturally occurring phenomena" has led to an interest in intra-individual behavior interactions. Such interactions are quite different from the intra-psychic relationships hypothesized by Freud and others, in that the focus is exclusively on observable behavior.

Barker and Wright (1955) offered some initial insights on this subject. "Most of the episodes did not occur in isolation. Behavior was more often like the interwoven strands of a cord than like a row of blocks in that the molar behavior units often overlapped [p. 464]." Thus, an interrelationship amongst an individual's behaviors is implied through concurrency. Under experimental conditions, Lovaas (1961) demonstrated that one "class of responses" can be altered, namely nonverbal aggression, by changing another "class of responses," verbal aggression. This relationship was revealed under a close temporal sequence. Similarly, Sherman (1964) was able to indirectly increase toy play by children by increasing their verbal statements about the toy. In addition to the above, there is evidence to indicate that not only do behaviors of individuals sometimes covary, but that the behaviors which contribute to a given response class do not necessarily share the face validity enjoyed by the concurrent and sequential relationships already described. Wahler, Sperling, Thomas, Teeter, and Luper (1970) were able to substantially reduce stuttering in two children by reducing hyperactivity in one child and oppositional

behavior in the other through the contingent application of parental attention. Similarly, the selective attention of another parent was able to directly reduce the oppositional behavior of her child, with the concomitant reduction of that child's enuresis as an accompanying change in the child's behavior (Nordquist, 1971).

Apparently, a change in one behavior may cause changes in other behaviors, which may or may not be expected. Such instances commonly occur in interventions with children and are usually termed side effects (Epstein, Doke, Sajwaj, Sorrell, & Rimmer, 1974; Samaan, 1972; Twardosz & Sajwaj, 1972). These phenomena have not been limited to normal or mildly disturbed children, as autistic children have also commonly displayed both negative and positive side effects (Bucher & Lovaas, 1968; Risley, 1968; Tate & Baroff, 1966). An assessment procedure which can identify response classes can aid in the prediction of side effects. Or, to put it another way, the multiple, direct effects of a single stimulus impingement may be anticipated and planned for. Furthermore, knowledge of the functional relationships between behaviors may permit the modification of accessible but nonproblematic behaviors in order to indirectly reduce or increase problematic behaviors which have proved resistant to direct manipulation.

Ecological Assessment

The methodology for studying the individual and his environment may be termed ecological assessment. Proceeding from the above description of behavioral ecology, an ecological assessment would target multiple

subject behaviors, multiple behaviors of significant others, and in multiple settings. Of course, such assessment would not entail the presentation of specified stimuli and the measurement of responses to these as is the traditional assessment procedure. To the contrary, the assessor or observor will operate as a Transducer (Barker, 1965) and limit as much as possible the interference of his presence so that he may come to know the common, everyday behavior of the subject.

In the truest sense, an ecological assessment cannot presume knowledge of the behavioral and setting relationships it aspires to measure. "In their most adequate form, ecological data are phenomena centered and they are atheoretical [Barker, 1969, p. 38]." However, the concerns of this research go beyond that of accumulating archives (Barker, 1969; Sells, 1969), although no discrediting of such endeavor is here intended. The primary goals of this research incorporate this interest in learning about the "natural" behavior of an autistic child, but are augmented by a particular intention to manifest the clinical applications of this approach to assessment. Influential stimulus conditions and intra-individual, response-response relationships are anticipated and will be investigated to gain some insight into what would be a therapeutic milieu for an autistic child.

CHAPTER II

METHOD

Subject

A single, white, male subject was studied who will hereafter be referred to as the child. By appearance he is normal and is, in fact, particularly handsome. When the study began, he was approximately three months past his fifth birthday. There is one sibling, three years his elder. She is described as being a sensitive child and subject to temper tantrums, but is essentially normal and is attending public school. The father is a college graduate and the mother has had some exposure to college. The home is maintained in a middle-class style.

The mother experienced a normal pregnancy and delivery with her child. The parents report that they were not aware of a problem during his first year of life. He was a quiet baby, easy to take care of, and he did make the customary baby sounds. In retrospect, the parents do not recall him making the usual preparatory movements to being picked up during this period.

At about one year of age, the parents gradually became aware that their child was rocking excessively. He did not walk till he was 18 months old and he still did not talk to that point. The family physician referred the child to the local Birth Defects Center when he was about two years old. At that time, the child seemed unresponsive to people and to the environment in general. The possibility of deafness was

explored and ruled out. The diagnosis of childhood autism was first made at this time. This diagnosis has since been concurred with by a number of agencies and professionals in the community. The child has had a chromosome study, an amino acid study, an EEG, and a mucopolysaccharides analysis. All of these were negative.

For about a year, from age 2-1/2 to 3-1/2, the child was the subject of a homebased, intensive behavior modification program. This treatment had minimal effect. A number of medications have also been tried including Vistaril, Phenobarbital, Mellaril, Dexadrine, and Ritalin. According to the mother, except for Ritalin, none of these had any manifest effect. Ritalin increased his hyperactivity. The child is not presently receiving any medication.

Approximately four months before the inception of this study, the child began attending a day treatment program at a local school for the handicapped. He remained there about one year. The termination of this study coincided with his transferring to a residential treatment center for autistic children in another city.

The parents currently describe their child as being emotionally cold and disinterested in human contact. His activity level is elevated and he frequently engages in ritualistic posturing of varied sorts. He exhibits destructive behavior directed towards himself, others, and objects. Except for rare instances of echolalia, he remains essentially mute. Toileting and disruptive eating habits persist as problems.

Settings

To study the naturally occurring behavior of this child, a sampling of his routine activities was attempted. Observations were made of the child in three settings. These three environments were relatively dissimilar and were chosen to examine the effect of diverse environments on his behavior. These will now be described.

Home

Observations were taken in this setting during the late afternoon, at about 4 p.m. The child usually arrived home from school at 3:30 p.m. The period of the observation was a relatively unstructured time. The sibling was home in 40% of the sessions. In about half of the sessions in which the sibling was home, at least one friend of the sibling was also present. The mother may have been employed in dinner preparations or self-directed activities, or may have involved herself with her child. The father was rarely present during this time.

The child was relatively free to move about the house and engage himself according to his discretion. A large part of his time was spent in the kitchen-dining area and the backyard. These two were joined by a glass sliding door. On the interior side of the kitchen-dining area, a short hallway led to the living room to the right and the bedrooms to the left. A variety of toys were readily available to the child throughout the house. A staircase leading to the basement was off limits to the child. He was instructed as to this rule. Other standing rules placed on him in this setting included:

1. He may not engage in aggressive or destructive acts.
2. He may not open the refrigerator.
3. Except for one specified cupboard, he may not enter the cupboards.
4. He may not take off his clothing.

The specification of rules in this and the other settings was necessary with regard to the scoring of opposition (O) in the behavior coding system.

The first 32 observation sessions in this setting were taken on a daily basis, excluding weekends. The last 41 sessions were taken three days a week, Monday, Wednesday, and Friday. During the course of the study, a few planned observations had to be cancelled due to illness or other extraneous factors. The observer's car breaking down on one occasion is an example. Additionally, two vacations of one and two weeks duration occurred in the midst of the study. Consequently, the sequential numbering of the sessions was employed for identification purposes and is not intended to imply continuous data. A total of 73 observation sessions were recorded in this setting stretching over approximately six months.

School a.m.

Observations were taken in this setting during the morning, at about 10 a.m. This was a structured classroom situation. There was one teacher and on the average, 3.5 other children present in each session. Group activities were usually specified by the teacher, leaving little room for idiosyncratic preferences amongst the children.

A great majority of the class time was spent with all of the children and the teacher sitting around a circular table engaged in a variety of simple motor and perceptual skills learning. Communication between the teacher and the children was ongoing. Communication amongst the children was encouraged.

The following rules were operative in this setting for the target child:

1. He may not engage in aggressive or destructive acts.
2. When the class is engaged in activities around the table, he may not leave his seat unless specific permission has been given.
3. He may not engage in unusual self-stimulation (US).

The observations in this setting were taken in two sequences. The first commenced approximately one week after observations began in the home. This sequence continued for about five weeks (22 observations). Observations were taken on a daily basis to match the home observations. Observations were resumed in this setting approximately three months later. The second sequence continued for about eight weeks (20 observations), and terminated with the ending of the study. During this sequence, observations were taken three days a week, again coinciding with the home sessions. Two different teachers were employed during the two sequences. However, the structure of the class remained essentially the same. A total of 42 observation sessions were recorded in this setting.

School p.m.

Observations were taken in this setting during the afternoon, at about 1:30 p.m. For the most part, this was a free play situation during which the child was showered with attention. One teacher was exclusively assigned to the target child during this period. When the weather would permit, the teacher and child would go outdoors. The child would play on the playground apparatus or in the wading pool. On inclement days, the teacher and child would either remain in the classroom or go to a small gymnasium. During this time period, the child was almost always guided to be in the midst of other children or, at least in close proximity to them. On the average, 3.2 other children were close enough for social interaction to occur during each session.

There were no standing rules in this setting. There was a higher level of acceptance and permissiveness here than there was in the more structured, task-oriented school a.m.

The observations in this setting were taken on the same days as those in the school a.m. A total of three different teachers assumed primary responsibility for the child over the two sequences. However, the basic planning and execution of this time period remained the same across all three. The only material change in session structure was introduced into the second sequence, which was a 10 minute snack for the child at the beginning of each observation. A total of 42 observation sessions were recorded in this setting.

Behavior Coding System

The coding system developed by Wahler, House, and Stambaugh (in press) was employed in this research. However, due to the idiosyncratic nature of some of the target child's behaviors, some aspects of the original category definitions had to be modified to fully and accurately rate his behaviors. Table 1 outlines the behavior categories used in this research. Where alterations have been made in the original scoring system, they are described in footnotes. The definitions given in Table 1 are brief and would make reliable scoring very difficult. However, full descriptions of the behavior categories are given in Wahler et al. (in press).

A total of 23 categories were employed. Of these, 16 described behaviors of the target child (response events), and 6 (the last 6 categories in Table 1) described behaviors of adults and other children (stimulus events). A final category, slash (SL), was neither a response nor a stimulus event. It indicates that no scorable response events occurred during the defined interval. For example, were the child to play with a toy (ST) for half an interval, and stare into space (NI) for the other half, SL would be scored because ST and NI both require that the behavior occur for the full interval in order to be scored.

Method of Observation

Behaviors were recorded based on their occurrence during 10 second intervals. A 5 second recording interval separated each observing interval. The onset of observe and record intervals was signaled to

Table 1

Description of the Category Codes

Compliance (C). This is scored for complying with an instruction.

Opposition (O). This is scored for not complying with an instruction or violating a standing rule.

Aversive Opposition (O-). This is scored for physical aggression directed toward self, directed toward others, or violent tantrums.[a]

Complaint (CP). This is scored for vocal whining or crying, or physically resisting a physical prompt.[a]

Self-Stimulation (S). This is scored for manipulating a body part.

Object Play (OP). This is scored for repetitive, nonpurposeful manipulation of an object.

Sustained Noninteraction (NI). This is scored when there is no meaningful interaction with an object (ST, SA), or any interaction with a person. To be scored, it must occur for the full ten second interval.

Vocalization (V). This is scored for any audible sound emitted from the child's mouth. In the case of a vocal CP, V must also be scored. Coughs and sneezes are also scored. Aa, Ac, SIa, or SIc may be scored with V when the sound initiates contact with others or is in response to attention.[b]

Unusual Self-Stimulation (US). This is scored for uncommon bodily manipulations. For this child, it usually represented rocking the body or twirling the fingers for no apparent reason. The child may be sitting or standing when US is scored. For example, the child may be scratching his leg while rocking back and forth, in which case both S and US would be scored.[b]

Sustained Toy Play (ST). This is scored for employing objects for play and not simply OP. To be scored, it must occur for the full ten second interval.

Sustained Work (SW). This is scored for on-task behavior such as chores in the home or schoolwork. Because of the low occurrence of these behaviors, the categories sustained work (SW) and sustained schoolwork (Ss) in the original scoring system were condensed into this category. To be scored, it must occur for the full ten second interval.

Table 1 (continued)

Approach Adult (Aa). This is scored for the child's initiating an interaction with an adult.

Approach Child (Ac). This is scored for the child's initiating an interaction with a peer.

Social Interaction with an Adult (SIa). This is scored for the child's responding to an adult.

Social Interaction with a Child (SIc). This is scored for the child's responding to a peer.

Slash (SL). This is simply a marker, indicating that no scorable child behavior occurred during the interval.

Sustained Attending (SA). This is scored for passively watching an event. To be scored, it must occur for the full ten second interval.

Nonaversive Adult Instruction (Ia+). This is scored for commands by an adult.

Aversive Adult Instruction (Ia-). This is scored for commands that are given in a punitive or hostile manner.

Nonaversive Adult Social Attention (Sa+). This is scored for adult interaction with the child, not including interactions that are scored Ia+ or Ia-.

Aversive Adult Social Attention (Sa-). This is scored for adult interactions done in a punitive or hostile manner.

Nonaversive Child Social Attention (Sc+). This is scored for peer interaction with the child.

Aversive Child Social Attention (Sc-). This is scored for peer interactions done in a punitive or hostile manner.

[a]This definition was styled to measure the particular behaviors emitted by this child, and represents a modification of the original definition for this category.

[b]This category was not in the original scoring system but was added to accommodate the particular behaviors emitted by this child. Its definition is given in greater detail than the others.

the observer by taped instructions delivered through the earplug of a portable cassette recorder. The observer would watch the target child, and proximal peers and adults for 10 seconds and then record during the next 5 seconds by checking the behaviors which occurred. Those behaviors which occurred during the record interval were not observed. A total of 120 observe and record sequences composed each observation session which amounted to exactly 30 minutes.

Observers

Seven undergraduate students shared the responsibility of taking observations during the course of the study.[2] Approximately 15 hours of training were required for each observer to master the category definitions and observation procedures. Most of this training time was spent in the rating of practice video tapes and in vivo practice.

During actual observation taking, the observers attempted to be as inconspicuous as possible, minimizing their stimulus value. They were instructed to stay as far away from the target child as accurate observing would allow (approximately 3 m). The observers avoided making eye contact with the target child, and ignored any instances of the child approaching them.

---

[2]An eighth observer, the author, did a majority of the observations in the school a.m. during the first sequence only.

Reliability Analyses

At weekly intervals, observers would double up on a rotating basis to do an observation. One tape recorder with a double earplug jack supplied the interval signals to both observers to insure simultaneous observation and recording. On the average, reliability observations were taken once in every 5.2 sessions in the home, every 3.5 sessions in the school a.m., and every 4.2 sessions in the school p.m.

Two kinds of reliability calculations were made for each category. In the first, referred to as Type I, only scored intervals were considered. In each session, the number of intervals in agreement were divided by the combined number of intervals in agreement and disagreement. Intervals in disagreement were those in which the category was scored by only one of either of the two observers.

The second reliability calculation, referred to as Type II, was more liberal. All intervals were now considered. Those intervals in which neither observer scored the occurrence of a category were counted as in agreement and were added to the numerator and denominator employed in Type I computations. For example, in a very low frequency behavior, three occurrences may have been marked in a session by each observer. Assuming the occurrences were scored concurrently in two intervals and sequentially in two others, the Type I reliability would have been 50% (2/4) and the Type II reliability would have been 98% (118/120). As revealed here, the Type I reliability is a more stringent measure of interval by interval agreement of behavior occurrences.

However, all data analyses in this research were across sessions and not within sessions, and the Type II measure is more appropriately suited to judge overall session reliability.

Data Analyses

To pursue the notions of response class and stimulus-response interactions, an examination of the covariation between behaviors across sessions was undertaken. A cluster analysis (Cureton, Cureton, & Durfee, 1970) was employed. It was computed for each setting with a cosine cutoff level designated at 0.60. The selection of the cosine level is aribtrary. The higher the cosine level, the more stringent the criteria for admission into a cluster, and vice versa. The cluster analysis was also computed at 0.50 and 0.70 cosine levels. These either admitted many behaviors with low correlations, or omitted many behaviors showing significant correlations. The 0.60 cosine level most fairly represented the data.

This clustering procedure, as it was originally designed, did not allow for categories to appear in more than one cluster. In other words, even if a category surpassed the acceptance criteria for two or more clusters, it would only be admitted into that one cluster with which it shared the highest relationship. For purposes of this research and clinical interpretation, this restriction was not adhered to.

The data points were represented by the percent occurrences for each category in each session. On the average, two or three intervals were not recorded in each session due to the target child being

obstructed from view temporarily, and other extraneous factors. This necessitated the use of percent occurrences rather than raw count of each category per session. Furthermore, the frequency distribution of the percent occurrence of each category within each setting did not generally meet the assumption of normal distribution inherent in cluster analysis. Consequently, the data was normalized according to the median method of converting to T scores. In each setting, a number of categories were omitted from the cluster analysis. Those behaviors which failed to occur in at least 75% of the sessions in a given setting and whose mean percent occurrence per session in that setting was less than 2% were too skewed to be normalized. For purposes of the cluster analysis, this deletion did not cause the loss of valuable data. These behaviors were in essence, absent from the behavioral repertoire of the child and did not covary with the measured response or stimulus events. The significance of their nonoccurrence will be attended to in the empirical analysis. Table 2 itemizes the admission or omission of each category in the three settings.

As an addition or aid in clarifying the cluster analysis, a Pearson product-moment correlation matrix was generated. The intercorrelation amongst the behaviors within each cluster will be shown. The complete correlation matrices for each setting are provided in the Appendix, Tables 11, 12, and 13.

To further investigate the questions of inter- and intra-setting variability in the child's behavior, Spearman rank correlations and *t* tests were computed. These statistics were utilized in two ways:

Table 2

The Listing of Categories According to Their Admission into or Omission from the Cluster Analysis

Setting					
Home		School a.m.		School p.m.	
admitted	omitted	admitted	omitted	admitted	omitted
C		C		C	
O		O		O	
CP		CP		CP	
S		S		S	
OP		OP		OP	
NI		NI		NI	
V		V		V	
US		US		US	
ST		ST		ST	
SIa		SW		SW	
Ia+		Aa		Aa	
Sa+		SIa		SIa	
	O-	SA		SL	
	SW	Ia+		SA	
	Aa	Ia-		Ia+	
	Ac	Sa+		Sa+	
	SIc	Sa-			O-
	SL	Sc+			Ac
	SA		O-		SIc
	Ia-		Ac		Ia-
	Sa-		SIc		Sa-
	Sc+		SL		Sc+
	Sc-		Sc-		Sc-

to compare the frequency of behaviors between settings and within settings. In the latter case, the observations taken in each setting were divided into two groups: the first half and the second half. With respect to the observations taken in the two school settings, natural (though not precisely equal) halves were created by the two sequences. Thus, in the school a.m. and school p.m., the first 22 observations comprised the first half and the last 20 observations comprised the second half. In the home, the demarcation between first and second halves was selected by dividing the total number of observations (73) by 2. Thus, the first 37 observations comprised the first half, and the last 36 observations comprised the second half.

In the Spearman computations, the six stimulus categories and slash (SL) were not included as the focus was on changes in the child's behavior only. Additionally, aversive opposition (O-), approach child (Ac), and social interaction with a child (SIc), were also omitted from these calculations. This was done because these three categories occurred at a mean rate of 0% in all three settings and were essentially absent from the behavioral repertoire of the child. Their deletion avoided the artificial elevation of the Spearman correlations.

A number of empirical procedures were done to increase the clarity of the presentation and to add to the understanding of the data. The 23 categories were bar graphed according to their incidence in each of the settings. Additionally, a frequency graph of sustained noninteraction (NI) was prepared to illustrate the daily fluctuations of a

behavior which "typifies" the child. And lastly, trends could be seen in the bar graph which suggested certain relationships between some of the behaviors. These relationships were further explored through the selective comparison of mean occurrences and Pearson product-moment correlation coefficients. This last procedure will be explained in greater detail in the results section.

CHAPTER III

RESULTS

Reliability

The Type I and Type II reliability for each behavior category according to setting, is presented in Table 3. Among those behaviors which occurred regularly (in at least 2% of the intervals), it was possible to establish a stable Type I reliability measure. Among the infrequently occurring behaviors, the Type I reliability fluctuated from session to session because so few intervals were involved. The range of reliability measures is presented in Table 4. Overall, mean reliability of 90% and 99% were attained at Type I and Type II levels respectively in the home, 85% and 98% in the school a.m., and 91% and 99% in the school p.m.

Statistical Analysis

The clusters which were generated by the cluster analysis are presented in Table 5 according to setting. The Pearson product-moment correlation coefficient is shown for each cluster. In the case of clusters composed of more than two behaviors, the correlation matrix is presented. A number of clusters which were generated by the analysis were deleted from the presentation. Four of these, complaint (CP) and vocalization (V), nonaversive adult instruction (Ia+) and compliance (C),

Table 3

Percentage of Interobserver Reliability

	Home		School a.m.		School p.m.	
	I	II	I	II	I	II
C	91%	100%	89%	97%	93%	99%
O	92%	100%	90%	96%	96%	100%
O-	71%[a]	100%	100%[a]	100%	-[b]	100%
CP	89%	100%	86%	99%	90%	99%
S	86%	95%	81%	94%	84%	97%
OP	92%	96%	81%	95%	86%	97%
NI	94%	97%	91%	95%	89%	98%
V	91%	97%	84%	97%	94%	99%
US	85%	96%	91%	97%	95%	99%
ST	93%	99%	50%[a]	100%	90%	99%
SW	89%[a]	100%	77%	99%	92%[a]	100%
Aa	80%[a]	100%	100%[a]	100%	91%	100%
Ac	-	100%	67%[a]	100%	-	100%
SIa	91%	99%	58%	98%	92%	98%
SIc	-	100%	90%[a]	100%	-	100%
SL	84%[a]	100%	36%[a]	99%	81%	98%
SA	75%[a]	100%	43%[a]	99%	50%[a]	100%
Ia+	89%	99%	81%	96%	95%	99%
Ia-	25%[a]	100%	58%[a]	100%	100%[a]	100%
Sa+	91%	98%	78%	94%	94%	96%
Sa-	33%[a]	100%	60%[a]	100%	0%[a]	100%
Sc+	-	100%	86%[a]	100%	100%[a]	100%
Sc-	-	100%	-	100%	-	100%

[a]This behavior occurred in fewer than 2% of the intervals in this setting.

[b]The - indicates that this behavior never occurred during the reliability sessions in this setting.

Table 4

Range of Reliability Percentages

	Home	School a.m.	School p.m.
Type I			
Frequent Behaviors	85-94%	58-91%[a]	81-96%
Infrequent Behaviors[b]	25-89%	36-100%	0-100%
Type II			
Frequent Behaviors	95-100%	94-99%	96-100%
Infrequent Behaviors	100-100%	99-100%	100-100%

[a]The reliability of 58% comes from SIa. This behavior occurred in about 9% of the intervals in the school a.m. The reason for this low reliability cannot be explained. The next lowest Type I reliability amongst the frequently occurring behaviors in this setting was 77%.

[b]These are the behaviors identified in Table 3 as occurring in fewer than 2% of the intervals.

Table 5

Clusters

Behaviors	Correlation Coefficient[a]
Home (df = 71)	
1. Sa+, Ia+, SIa	Ia+ SIa Sa+ +.511 +.679 Ia+ +.718
2. Sa+, CP, O	CP O Sa+ +.507 +.605 CP +.642
3. SIa, O, C	O C SIa +.445 +.662 O +.357
4. Sa+, C	+.434
5. Sa+, US	-.373
6. ST, OP	-.339
7. NI, S	-.333
8. ST, US	+.317
School a.m. (df = 40)	
1. Sa+, NI	-.660
2. Sa-, Ia-	+.554
3. SA, NI	-.491
4. SA, OP	-.442
5. Aa, ST	+.299[c]
6. V, S	+.268[c]
7. S, C	-.268[c]
School p.m. (df = 40)	
1. V, CP, C	CP C V +.711 -.554 CP -.430
2. SIa, OP	-.543
3. SIa, V	+.519
4. Ia+, V	-.482
5. SW, O	+.453
6. Sa+, SA, US	SA US Sa+ +.376[b] -.507 SA -.194[c]
7. OP, S	-.327[b]

[a]Unless otherwise indicated, all correlations are significant, $p<.01$.

[b]$p<.05$.

[c]Does not reach significance at .05 level.

nonaversive adult instruction (Ia+) and opposition (O), and nonaversive adult social attention (Sa+) and social interaction with adults (SIa), are artifactual because the scoring system mandates that these pairs be scored together in most situations. For example, any vocal complaint (CP) would necessarily also be scored as vocalization (V). Therefore, the correlation between these two is determined by the nature of the scoring system and does not reflect a relationship between two independently occurring behaviors. In the school a.m., unusual self-stimulation (US) was defined by the teacher as rule-breaking and as such, opposition (O) was automatically scored along with each instance of US. This cluster was also judged to be artifactual. Lastly, slash (SL) clustered with a number of behaviors and these were not reported in view of the fact that SL is uninterpretable. However, there were a few instances in which an independently occurring beahvior intercorrelated with two behaviors which were artifactually related. In these cases, the entire three member cluster was reported.

Over the three settings, a total of 22 clusters are reported. The inverse relationship between nonaversive adult social attention (Sa+) and unusual self-stimulation (US) showed up in the home and the school p.m. This was the only cluster to appear in more than one setting. However, none of the response-response clusters appeared in more than one setting, suggesting that the structure of this child's behavior was different in different environments. Spearman rank correlation coefficients and t tests were also employed to further explore the structure of this child's behavior and its relationship to the environment.

The comparison of the rank order of the behaviors showed a significant high correlation in most cases (see Table 6). This analysis suggests that the child's behavior is quite consistent over time in a given setting. Moreover, it suggests consistency between settings which is in contrast to the results of the cluster analysis.

A similar comparison, between settings and between halves within settings, was undertaken by means of t tests (Tables 7 and 8). Sixteen child behaviors were measured in each of three settings (not including SL). The incidence of seven were significantly different between home and school a.m., nine between home and school p.m., and twelve between school a.m. and school p.m. (see Table 7). With respect to the first and second halves within each setting, five were significantly different in the home, four in the school a.m., and ten in the school p.m. (see Table 8). On the average, 58% of the child's recorded behaviors changed from setting to setting, and 40% changed within settings from the first half to the second half of the study. These results indicate the child's behavior is considerably less monotonic than indicated by the Spearman correlations, but also, less diverse than the results of the cluster analysis suggest.

The 23 behaviors of the observational system are presented in Figure 1. For each behavior, its incidence in the three settings is shown. Figure 1 is a graphic display of the same percentages given in Table 7. With reference to the t scores given in Table 7, one can more readily see the occurrences of the behaviors amongst the three settings.

Table 6

Spearman Rank Correlation Coefficients

Comparisons	r	Significance
Settings		
Home, School a.m.	+.63	t (11) = 2.66, $p<.05$
Home, School p.m.	+.85	t (11) = 5.40, $p<.01$
School a.m., School p.m.	+.51	t (11) = 1.97
1st and 2nd Halves		
Home	+.96	t (11) = 11.69, $p<.01$
School a.m.	+.88	t (11) = 6.11, $p<.01$
School p.m.	+.77	t (11) = 3.99, $p<.01$

Table 7

Category Percent Occurrence per Session and t Tests of Differences between Means across Settings

Category	Home Mean	Home S.D.	School a.m. Mean	School a.m. S.D.	School p.m. Mean	School p.m. S.D.	Significance
C	3.19%	3.14	23.12%	10.09	8.29%	6.40	$p<.01^{a,b,c}$
O	3.73%	5.33	33.12%	16.72	6.36%	7.61	$p<.01^{a,c}$
O-	0.48%	1.26	0.24%	0.73	0.05%	0.22	
CP	7.82%	9.05	4.86%	5.31	10.02%	9.48	$p<.01^{c}$
S	36.63%	21.37	29.19%	11.92	24.55%	14.54	$p<.01^{b}$
OP	47.81%	22.52	23.40%	10.67	17.12%	13.74	$p<.05^{c}$ $.01^{a,b}$
NI	54.11%	22.48	53.64%	16.60	25.40%	19.24	$p<.01^{b,c}$
V	37.38%	15.12	15.90%	9.04	30.00%	14.90	$p<.05^{b}$ $.01^{a,c}$
US	26.42%	16.71	28.62%	18.07	20.14%	16.37	$p<.05^{b,c}$
ST	4.27%	8.89	1.10%	2.84	6.55%	8.79	$p<.01^{a,c}$
SW	0.26%	0.67	3.45%	3.92	1.43%	2.20	$p<.01^{a,b,c}$
Aa	0.74%	1.16	1.14%	1.79	3.31%	3.19	$p<.01^{b,c}$
Ac	0.05%	0.23	0.29%	0.64	0.05%	0.22	
SIa	10.84%	12.00	8.67%	9.23	30.40%	22.77	$p<.01^{b,c}$
SIc	0.07%	0.42	0.40%	1.01	0.00%	0.00	
SL	1.63%	2.10	1.98%	2.03	6.90%	6.65	$p<.01^{b,c}$
SA	0.36%	0.89	1.88%	2.90	0.55%	0.92	$p<.01^{a,c}$
Ia+	4.47%	4.42	24.45%	11.69	8.86%	6.20	$p<.01^{a,b,c}$
Ia-	0.33%	0.99	1.05%	1.15	0.05%	0.22	$p<.01^{a,c}$
Sa+	21.64%	16.93	26.60%	13.54	72.55%	19.83	$p<.01^{b,c}$
Sa-	0.38%	1.09	0.86%	1.20	0.33%	2.01	
Sc+	0.14%	0.84	0.86%	1.91	0.17%	0.58	$p<.05^{a,c}$
Sc-	0.03%	0.23	0.00%	0.00	0.02%	0.15	

[a]Between home and school a.m., *df* = 113.

[b]Between home and school p.m., *df* = 113.

[c]Between school a.m. and school p.m., *df* = 82.

Table 8

Category Percent Occurrence per Session in Each Half of Each Setting and *t* Tests of Differences between Means of Halves

Category	Home 1st Mean	Home 2nd Mean	School a.m. 1st Mean	School a.m. 2nd Mean	School p.m. 1st Mean	School p.m. 2nd Mean	Significance
C	3.70%	2.67%	24.64%	21.45%	4.36%	12.60%	$p<.01^{c}$
O	3.43%	4.03%	21.68%	45.70%	2.64%	10.45%	$p<.01^{b,c}$
O-	0.16%	0.81%	0.05%	0.45%	0.05%	0.05%	$p<.05^{a}$
CP	7.65%	8.00%	5.59%	4.05%	14.41%	5.20%	$p<.01^{c}$
S	34.22%	39.11%	30.68%	27.55%	28.45%	20.25%	$p<.05^{c}$
OP	45.97%	49.69%	22.09%	24.85%	13.86%	20.70%	
NI	60.51%	47.53%	51.18%	56.35%	33.41%	16.60%	$p<.05,^{a}$ $.01^{c}$
V	42.11%	32.53%	19.23%	12.25%	40.00%	19.00%	$p<.01^{a,b,c}$
US	32.59%	20.08%	17.05%	41.35%	27.50%	12.05%	$p<.01^{a,b,c}$
ST	6.43%	2.06%	1.14%	1.05%	7.82%	5.15%	$p<.05^{a}$
SW	0.22%	0.31%	2.82%	4.15%	0.64%	2.30%	$p<.05^{c}$
Aa	0.57%	0.92%	0.77%	1.55%	2.05%	4.70%	$p<.01^{c}$
Ac	0.11%	0.00%	0.23%	0.35%	0.05%	0.05%	
SIa	12.68%	8.94%	11.77%	5.25%	41.59%	18.10%	$p<.05,^{b}$ $.01^{c}$
SIc	0.08%	0.06%	0.27%	0.55%	0.00%	0.00%	
SL	1.35%	1.92%	3.09%	0.75%	2.14%	12.15%	$p<.01^{b,c}$
SA	0.46%	0.25%	2.05%	1.70%	0.59%	0.50%	
Ia+	5.16%	3.75%	30.77%	17.50%	5.23%	12.85%	$p<.01^{b,c}$
Ia-	0.51%	0.14%	1.27%	0.80%	0.00%	0.10%	
Sa+	19.92%	23.42%	27.91%	25.15%	74.27%	70.65%	
Sa-	0.46%	0.31%	0.77%	0.95%	0.59%	0.05%	
Sc+	0.24%	0.03%	0.82%	0.90%	0.00%	0.35%	
Sc-	0.00%	0.06%	0.00%	0.00%	0.05%	0.00%	

[a]Home, *df* = 71.

[b]School a.m., *df* = 40.

[c]School p.m., *df* = 40.

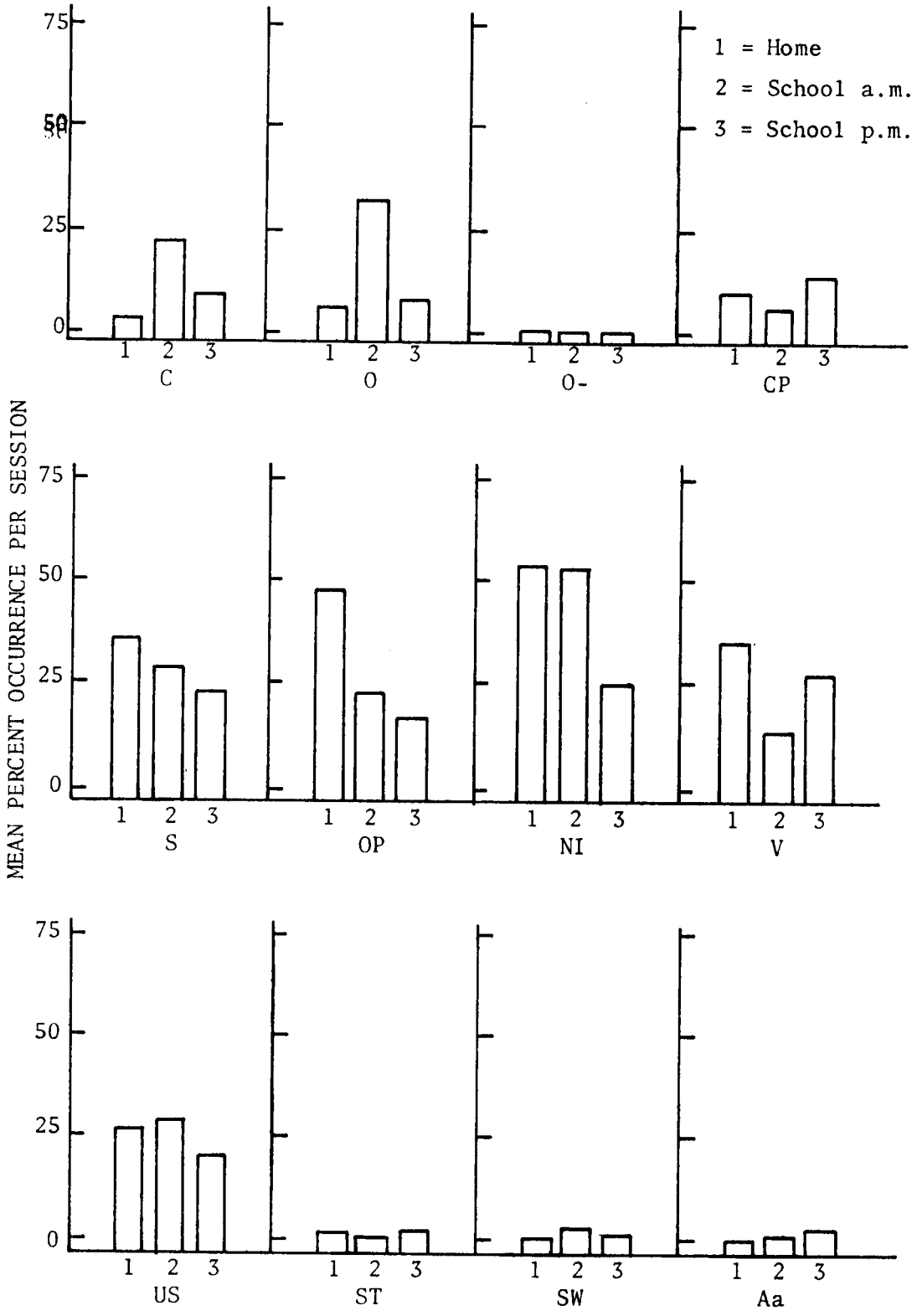


Figure 1. A comparison of the child's behaviors in the three settings.

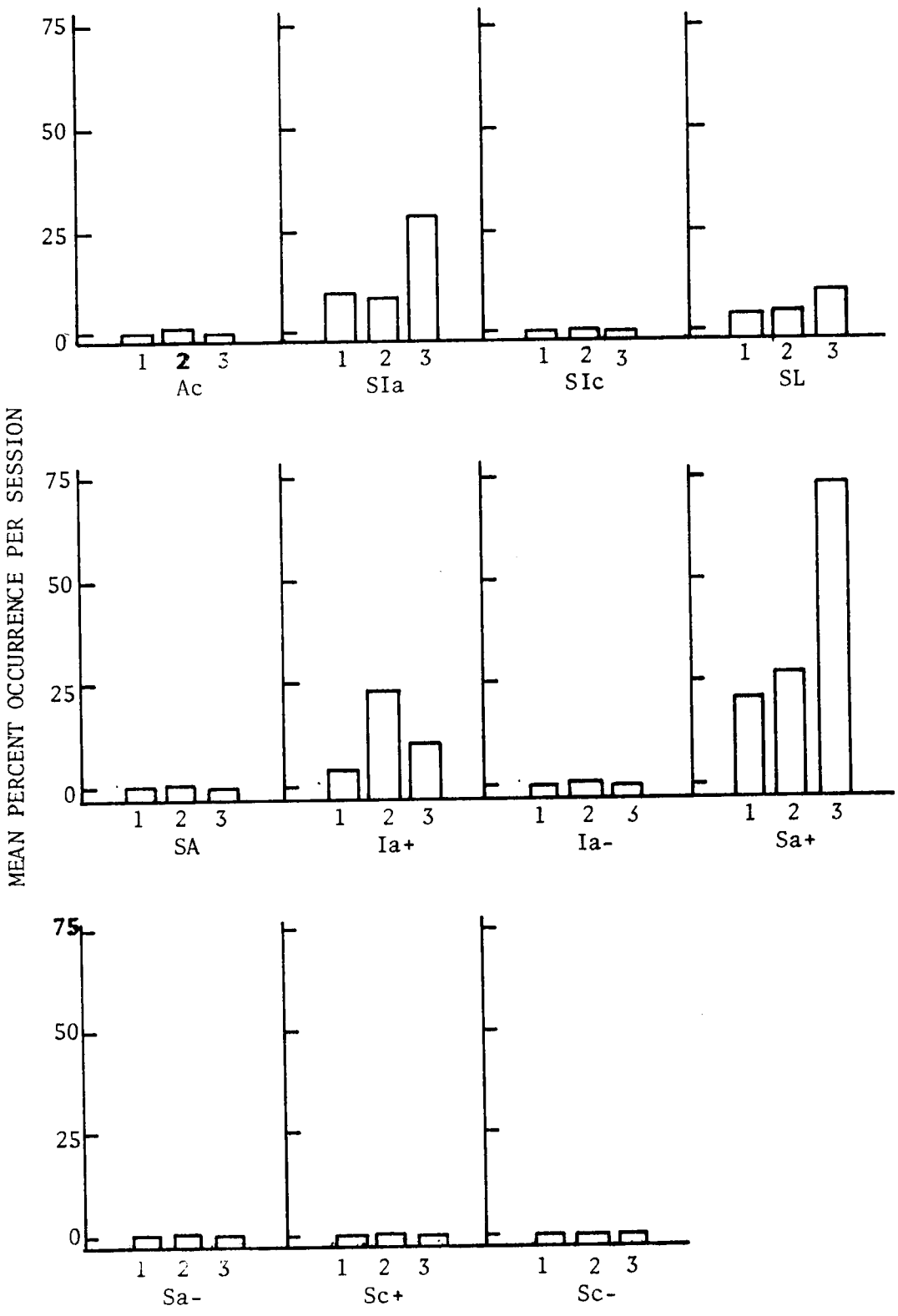


Figure 1. (continued)

There were three child behaviors which failed to achieve even one significant $\underline{t}$ score between any two settings. These were aversive opposition (O-), approach child (Ac), and social interaction with a child (SIc). These were the only child behaviors which occurred at a mean rate of 0% in all settings. Let us ignore, for the moment, these three behaviors which are apparently absent from the behavioral repertoire of this child. When the percentage of behaviors which change from setting to setting is recomputed based on a total of 13 behaviors instead of 16, the average rate increases from 58% to 72%. In other words, from amongst those recorded behaviors of this child which are in fact occurring, on the average 7 out of 10 will significantly change in frequency of occurrence when this child's environment changes.

Another view of this lack of consistency may be had by looking at the daily occurrence of this child's behavior. The standard deviations shown in Table 7 are generally high. The category sustained noninteraction (NI) was selected for illustration because it was the most frequently occurring behavior of the child. Otherwise, the choice was arbitrary, as all of his high frequency behaviors characteristically showed the extreme fluctuations from day to day as revealed in Figure 2. (The school a.m. setting was chosen because there were far fewer sessions than in the home, while the mean frequency of occurrence was the same, making the task of graphic presentation a simpler one.) On some days the child was very "dreamy, detached, and unresponsive," and on other days far more involved in his environment. During the observation sessions on these 42 days, the child engaged in as little as 19% to

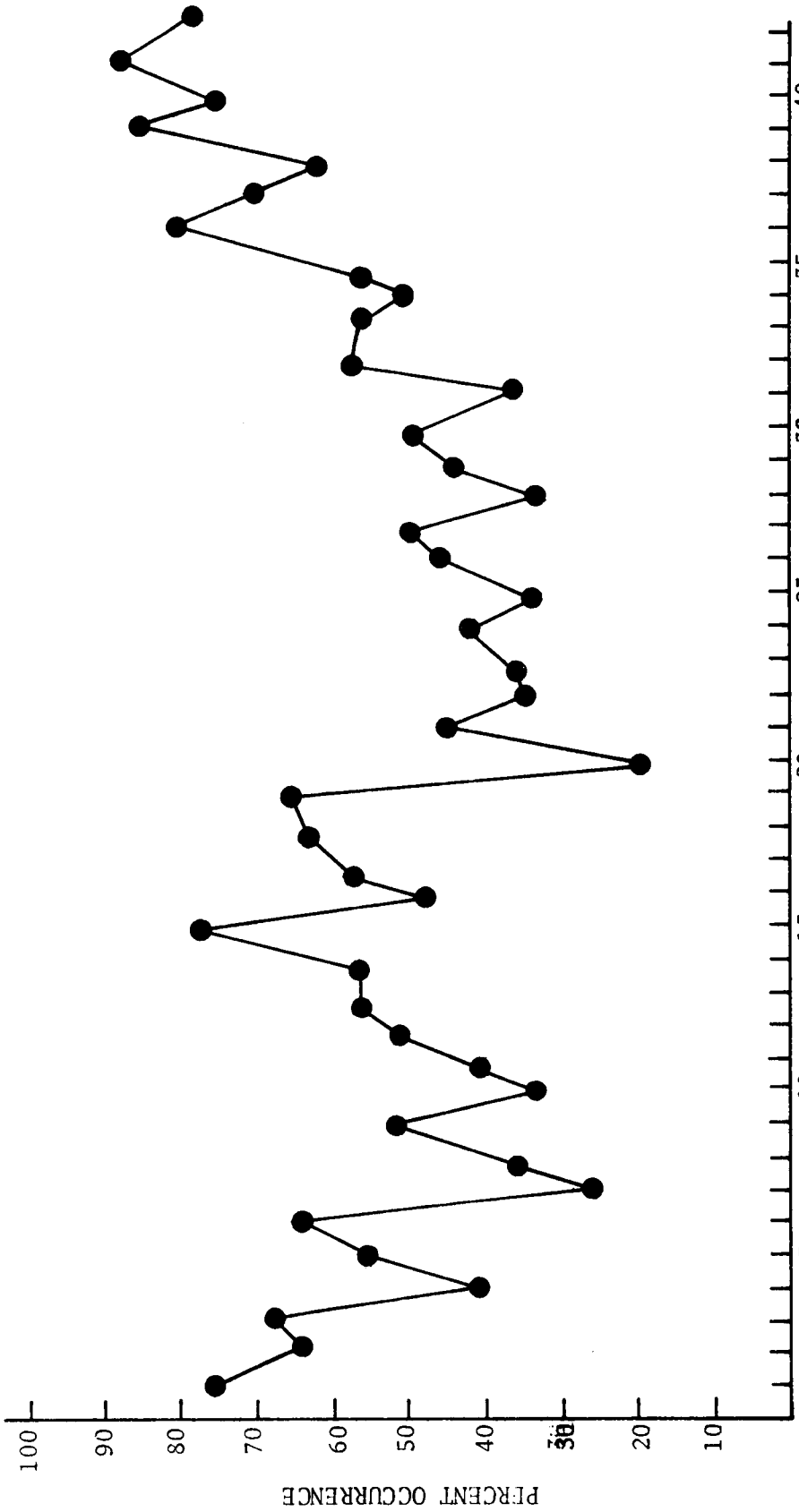


Figure 2. The daily percent occurrence of sustained noninteraction in the school a.m.

as much as 88% NI. The phrase "autistic aloneness" was far more appropriate on some days than it was on others.

The pathology of this autistic child was most sharply reflected in the categories self-stimulation (S), object play (OP), sustained noninteraction (NI), and unusual self-stimulation (US). These were his most frequently occurring behaviors (along with vocalization (V)). In a sense, however, his pathology was equally reflected by the low occurrence of sustained toy play (ST), sustained work (SW), approach adult (Aa), and approach child (Ac). This pattern fits very well with the classic description of autistic children. However, the fluctuations in behavior both within and across settings described above (see Tables 5, 7, and 8, pages 29, 33, and 34, respectively), are buried by the use of arithmetic means and global, summary descriptions.

The categories S, OP, NI, and US show a gradual downward trend in occurrence from the home, to the school a.m., to the school p.m. (see Figure 1, page 35). This is particularly marked in the cases of S and OP. At the same time an opposite trend occurred in the stimulus category, nonaversive adult social attention (Sa+). An inquiry was made into the possibility of an inverse relationship between Sa+ and the occurrence of this child's pathological behaviors in general.

Table 9 shows the correlation coefficient between Sa+ and each of these four behaviors in the three settings. Of the 12 correlations, 11 are negative including 3 significant at the .05 level and 3 significant at the .01 level.

To further enlighten these relationships, the sessions were grouped according to the frequency of occurrence of Sa+. It was reasoned that

Table 9

Pearson Product-Moment Correlations between Sa+ and the Pathological Behaviors

	r		Level of significance
Home			
Sa+	-.035	S	
Sa+	-.251	OP	$p<.05$
Sa+	-.028	NI	
Sa+	-.373	US	$p<.01$
School a.m.			
Sa+	-.101	S	
Sa+	-.035	OP	
Sa+	-.660	NI	$p<.01$
Sa+	-.218	US	
School p.m.			
Sa+	+.006	S	
Sa+	-.369	OP	$p<.05$
Sa+	-.333	NI	$p<.05$
Sa+	-.507	US	$p<.01$

if S, OP, NI, and US were varying inversely with Sa+, then on those days when Sa+ showed its highest or lowest frequencies, the relationships should be more apparent. In each setting, one-third of the sessions were extracted which were the days when Sa+ was the lowest and one-third when it was the highest. For these two groups, the lower third and upper third, the mean percent occurrence per session was calculated for the five behaviors in question. These results are presented in Table 10. If indeed an inverse relationship existed, the four pathological behaviors would be expected to show a rise in frequency on those days when Sa+ was lowest and a drop in frequency when Sa+ was the highest. Across the three settings, 10 out of 12 times, S, OP, NI, and US were higher in the lower third group than they were in the upper third group. In 7 out of 12 cases, the mean percent occurrence in the lower and upper third groups were higher and lower respectively compared to the mean percent occurrence across all sessions for that behavior.

As the correlation coefficients would indicate (see Table 9), the relationship between Sa+ and S was a weak one and this is born out in Table 10. In all three settings, the inverse relationship between Sa+ and NI is further manifested in Table 10. This is the case in two of the three settings with respect to Sa+ and OP, and Sa+ and US. Consistently, though not absolutely, when Sa+ goes up, NI, OP, and US go down.

Table 10

The Grouping of Sessions According to the Highest and Lowest Frequencies of Sa+ and the Accompanying Fluctuations in S, OP, NI, and US

	Mean percent occurrence per session		
	All sessions	Lower third	Upper third
Home			
Sa+	22%	5%	41%
S	36%	34%	33%
OP	48%	55%	41%
NI	54%	60%	52%
US	26%	35%	22%
School a.m.			
Sa+	27%	14%	43%
S	29%	31%	30%
OP	23%	24%	25%
NI	54%	64%	41%
US	29%	27%	22%
School p.m.			
Sa+	73%	50%	92%
S	25%	24%	25%
OP	17%	23%	14%
NI	25%	34%	24%
US	20%	28%	15%

CHAPTER IV

DISCUSSION

The behavior of this autistic child is at variance with the classical notion of autism. While the pathological behaviors are generally high and the constructive behaviors are generally low, comparisons of this child's behavioral categories both within and across settings show marked changes. Although psychodynamic theory would predict and research (Raush, Farbman, & Llewellyn, 1960) has indicated that the more deviant an individual, the more rigid and inflexible his behavior, even this child showing extremely aberrant behavior, demonstrated variability in his natural environments.

Informal impressions derived from spending time with the child reflect the conclusion drawn from the data. At one moment he may be laughing from seeing something silly, at another moment working intently on a pegboard, and another time rocking back and forth while staring blankly into space. The autistic child emits much normal behavior which is either unheeded or unappreciated. Some of the behaviors of autistic children are so uncommon and bizarre, that these marks of pathology command a disproportionately high amount of attention and celebration. In the service of summary communication and impressively sounding diagnostic labels, the individuality and differentiation of autistic children may have been overlooked or dismissed. And worse, the expectation that the autistic child does not and can not emit the

diversity of behavior common to others, may lead to a disinterest in reinforcing or evoking such diversity. This resignation could contribute as a self-fulfilling prophecy to the confirmation of this pessimistic attitude toward the autistic child (Meichenbaum, Bowers, & Ross, 1969; Rosenthal, 1969).

A "desire for the preservation of sameness" could not be detected in this child. Similarly, the high level of disruptive and complaining behaviors that would result from such an obsessive desire did not occur. Rather than concluding that this child is therefore not autistic, it is suggested that the term autism does not represent a monolithic behavioral syndrome but a diversity of behavior marked by symptomatic themes that show variability across autistic children in the same sense that the child in this study showed variability across settings.

The assertion of intersetting variability of this child is further supported by the results of the cluster analysis. No response class reappeared in two settings. It is interesting to note that Wahler (1975) working with a far less disturbed population, oppositional children, also found that response classes do not reappear across settings. Some consistencies in particular behaviors could be noted both within and across settings. These were particularly prominent in the case of behaviors which were almost always absent from the repertoire of the child. Aversive opposition (O-) is an example. The tantrums, aggressive acts, and destructive acts which were anticipated due to information provided by the parents rarely occurred during the observations in any of the settings. Therefore, it is inferred from the anecdotal

reports that O- occurred infrequently but intensely, and left a severe impression with the parents which caused them to exaggerate the actual frequency of occurrence.

Besides O-, approach child (Ac) and social interaction with a child (SIc) also did not occur. Furthermore, other children rarely attended either positively (Sc+) or negatively (Sc-) to the target child. In reference to the general behavior of autistic children, Kanner (1943) remarked that "when with other children, he does not play with them. He plays alone while they are around, maintaining no bodily, physiognomonic, or verbal contact with them [p. 247]." For unknown reasons, this autistic child (and autistic children generally?), may qualitatively differentiate children and adults. Although the social interactions amongst the other children were not recorded, it appeared that lively interactions were common between them even though they ignored the target child. In the home, the older sibling had "given up" on the target child. It is assumed that extinction of her attending behaviors occurred. An explanation for the absence of peer attention to the target child in the school settings is less apparent. Although extinction may provide a partial explanation, new children regularly gained physical proximity to the target child without initiating social contacts with him. At the present time, no explanation for this can be offered.

From the 22 response classes produced by the cluster analysis, some mirror the findings of prior research with autistic children. This research focused with particular clarity on the role of self-stimulatory behaviors as an obstacle to the autistic child's ability

to perceive environmental stimuli. The term "self-stimulatory" is not defined in precisely the same manner by all authors. Frequently, what have been referred to as the pathological behaviors in this paper, namely self-stimulation (S), object play (OP), sustained noninteraction (NI), and unusual self-stimulation (US), have been grouped under the singular descriptor of self-stimulation. This term will be clarified with regard to its meaning in each of the articles cited hereafter.

Lovaas, Litrownik, and Mann (1971) taught a simple discrimination task to autistic children--advancing across a room to get candy when a tone is sounded. After the children gained mastery, experimental trials were distinguished according to whether or not the subject was engaged in self-stimulation (S, OP, NI, and US) when the tone was presented. They found that the mute autistic children were far less responsive to the tone when engaged in self-stimulation. Over successive sessions, however, the response latency to the tone during self-stimulation did decrease suggesting that the children were able to somewhat refocus their attention. The authors concluded that when the autistic child is not self-stimulating, he is more aware of environmental stimuli, and is more responsive to those stimuli. Koegel and Covert (1972) found that it was necessary to suppress self-stimulatory behaviors (S, OP, NI, and US) before two autistic children could learn a simple discrimination task. With a third child who was able to learn the task without the prior suppression of his self-stimulation, the self-stimulation reduced attendant to the increases in correct discrimination responding. The conclusion of the above studies, that reducing self-stimulation in

autistic children increases their awareness of the environment, is supported by the findings of still more research (Lovaas, Frietag, Kinder, Rubenstein, Schaeffer, & Simmons, 1966; Risley, 1968). A number of the response events in the present research reflect an awareness and responsiveness to the environment by the child. Many of these correlated inversely with the pathological behaviors supporting the laboratory findings reported above. In shorthand, they are as follows: sustained toy play (ST)/-/OP, home; compliance (C)/-/S, sustained attending (SA)/-/NI, SA/-/OP, school a.m.; social interaction with an adult (SIa)/-/OP, SA/-/US, school p.m. One exception to the above examples did occur, ST/+/US, home. At the present time, this cannot be explained.

An understanding of why autistic children seem relatively cut off from environmental stimuli when self-stimulating (S, OP, NI, and US) may come from the selective attending that these children frequently show (Lovaas & Schreibman, 1971; Lovaas, Schreibman, Koegel, & Rehm, 1971). Autistic children were taught to respond to a discriminative stimulus composed of multiple sensory stimuli: auditory, visual, and tactile. On later trials, when the stimuli were presented singly, each subject would fully respond to only one of them suggesting that he did not originally perceive all components of the S^D. The stimulus responded to by each child differed, indicating there is no preferred modality for autistic children as a rule. Apparently, autistic children can adequately process stimuli through only one perceptual modality at a time. Thus, if they are locked into tactile or kinesthetic stimuli

(self-stimulation), auditory or visual stimuli register partially or not at all.

A further understanding of this subject has been offered in terms of the theory that organisms seek to maintain an optimal level of arousal (Berlyne, 1960). Thus, self-stimulatory kinds of behaviors are seen as homeostatic devices which redirect the autistic child's attention, reducing the impingement of environmental stimuli which would contribute to cortical arousal (Hutt, Hutt, Lee, & Ounsted, 1964). In any case, it appears that self-stimulation (S, OP, NI, and US) is not only incompatible with the autistic child's meaningfully interacting with his environment, but is also inversely correlated with such interaction.

The specific relationship between self-stimulatory behaviors and toy play has been studied. In a playroom, self-stimulation (S, OP, NI, and US) was suppressed, without manipulating any other aspect of the autistic child's behavior (Koegel, Firestone, Kramme, & Dunlap, 1974). A spontaneous increase in toy play accompanied the above alteration. This closely follows from the viewpoints of selective attending and physiological arousal described above and is reflected in the following response class revealed in the child in this study: ST/-/OP, home. However, in the same setting, ST/+/US also occurred which conflicts with the above findings. Koegel et al. (1974) did not differentiate the role of the four pathological behaviors cited above, and it is possible that the reduction in OP was far more responsible for the results in that experiment than was the reduction in US. This issue is further confused by the research of Hutt, Hutt,

Lee, and Ounsted (1965). They found that increases in block play and decreases in gesturing (S, US) occurred when adults intervened in the activities of autistic children. However, the nature of the intervention by these adults was not detailed. It may be that they systematically attempted to manipulate increases in ST and decreases in S and US so that the changes may not necessarily represent a functional relationship within the behavioral structure of the children.

Another view of the self-stimulatory behaviors may be had by considering the role of nonaversive adult social attention (Sa+). The inverse relationship between Sa+ and the pathological behaviors US (home), NI (school a.m.), and US (school p.m.) deserves general attention, particularly in light of the consistency of the negative correlation between Sa+ and OP, NI, and US in all settings. (Such a consistent inverse correlation between Sa+ and S did not exist.) Increased attentiveness to the environment by this child accompanied decreases in the pathological behaviors. This has previously been discussed. It is possible that the increase in Sa+ was due to the adult's perceiving the child as being more receptive during these periods, and the adult responded accordingly. In this case, the Sa+ had no direct effect on the occurrence of the pathological behaviors, except perhaps to delay their future onset. Or, the Sa+ may have occurred during these pathological behaviors and interrupted the self-stimulatory sequence, thus serving to refocus the child's attention to the environment in accordance with the perceptual selectivity and physiological arousal notions described above. As a third alternate explanation, Sa+ may have been delivered consistently during the

absence of the variety of self-stimulatory behaviors suggesting that OP, NI, and US decreased through the differential reinforcement of other behaviors. The validity of the first and third explanations is doubtful, since consistent contingencies of these kinds were not planned in any of the settings. With particular reference to the third explanation, social attention had not proved to be a powerful reinforcer for this child in the past and it is unlikely that it could have altered the frequency of these behaviors by its contingent application. Attempts to increase eye contact (McConnell, 1967; Ney, 1973) and language (Risley & Wolf, 1967) in autistic children through the application of noncontingent reinforcement have not been as satisfactory as contingent reinforcement. These studies focused on building appropriate behaviors. However, with reference to the second explanation given above, the role of noncontingent adult social attention in reducing undesirable behaviors and indirectly increasing constructive behaviors, has received little experimental investigation. The expression of unconditional love and the resulting development of object relations between the autistic child and the therapist are the basic procedure and rationale for psychoanalystic therapy with autistic children (Bettelheim, 1967; Mahler, 1952; Rank, 1949). More recently, an analytically based approach to treating autistic children called "structural therapy" emphasized the importance of attending to the child to disrupt his self-stimulatory behaviors (Ward, 1972). Although the constructs referred to by the psychoanalytic writers have not been demonstrated, there is somewhat of a fit between their position and

the phenomena observed in this study. It is possible that the beneficial effects of analytic treatment for autistic children are more real than its rationale. The fact remains that in the school p.m., the child looked the healthiest in comparison to the two other settings. S, OP, NI, and US were their lowest. Sustained toy play (ST), approach adult (Aa), and social interaction with an adult (SIa) were their highest. At the same time, Sa+ occurred at a rate in the school p.m. that about tripled its occurrence in each of the other settings. This was the only major change in a stimulus event that could be detected. Besides this, the general stimulus conditions in the school p.m. and the home were very similar. It is assumed (though not demonstrated), that the highly elevated level of Sa+ significantly contributed to the improvement of the child.

One last observation about the response classes will be offered. In two settings inverse relationships occurred between pathological behaviors: NI/-/S, home; OP/-/S, school p.m. It has been suggested that the autistic child prefers self-stimulatory behaviors to other forms of activity (Lovaas, Litrownik, & Mann, 1971). Additionally, the theory that the autistic child seeks to maintain an optimal level of arousal (Berlyne, 1960) and employs self-stimulation in this endeavor (Hutt et al., 1964) would suggest that the suppression of one kind of self-stimulation would give rise to an increase in another. Interventions focusing on the reduction of particular self-stimulatory behaviors ought to monitor changes in the others.

In an ecological assessment, where no controls are imposed on either the environment or the subject, firm conclusions must narrowly reflect the raw data. Although attempts at interpretation or generalization may be necessary from a theoretical perspective to integrate prior research or a hypothetical perspective to stimulate future research, they can receive only tenuous confirmation from the current methodology. There are important limitations to the current study and these will now be discussed.

Kanner (1943) referred to a "coming out" of the rigid autism which sometimes appeared at age five or six. It is unlikely, however, that the flexibility and occasional "normalcy" of this child can be attributed to this. The parents report no appreciable change in their child's behavior over the past few years. Additionally, no trend towards improvement could be seen in the data of this study or by informal observation of the child over the six months which this research lasted.

In general, the analyses employed in this research were of a correlational or empirically descriptive sort. No formal attempt was made to evaluate antecedent or consequent events from an operant framework. This would have been beyond the scope, the design, and the intent of this research. Consequently, when causation has been attributed, it has been done with the limited intent of suggesting possibilities with all due caution and modesty.

Response classes may change over time and varying environmental conditions within a given setting (Wahler, 1975). The identification of such clusters does not insure that functional relationships mutually exist or that their durability and stability may be assumed.

It has not been demonstrated that the child studied in this research is representative of that class of children called autistic, in the monolithic sense that one Chevrolet Impala is representative of all Chevrolet Impalas. Indeed, the thrust of this research would imply that all autistic children are different. Any generalizations made in this study have been offered with timidity.

The foregoing discussion will now be summarized:

1. This autistic child exhibited a diversity of behavior over time in a given setting and across settings. Intermittent with the "bizarre and dramatic" behavior was healthy, constructive behavior.

2. The child showed a marked absence of relatedness to other nonautistic children. He showed far greater responsivity to adults.

3. A number of response classes were identified which reflected an inverse correlation between the child's self-stimulatory behaviors, and his attentiveness and responsiveness to the environment. This finding was very compatible with prior research, and represents a critical concern in doing therapy with autistic children.

4. Elevated levels of adult attention were consistently related to reduced levels in most of the self-stimulatory behaviors. It was hypothesized that the attention interrupted the self-stimulatory behaviors and indirectly caused increases in appropriate behaviors, which were also inversely correlated with the self-stimulatory behaviors. The above sequence was proposed as a possible rationale for psychoanalytically based therapy programs for autistic children.

5. Two response classes showed inverse relationships between self-stimulatory behaviors. Intervention programs might anticipate the inadvertent elevation of some undesirable behaviors accompanying the planned suppression of others.

6. Some important limitations to this study were reviewed.

The ecological assessment of the autistic child raised far more questions than it answered. The possibilities for future research that could reasonably be generated from this study seem countless. Some of the more critical issues which appear to this investigator to merit priority attention are:

1. A statistical methodology need be developed that can identify functional and stable response classes which need not await experimental, post hoc validation. Accurate prediction of multiple treatment effects would then be possible, thus enabling the minimization of negative side effects and the maximization of positive side effects.

2. The nature of the relationships between adult attention and the self-stimulatory behaviors of autistic children needs replication and clarification, so that it may more wisely be employed as a therapeutic tool.

3. If indeed most autistic children maintain a nonrelatedness to other children, the nature and implications of this situation need clarification. For example, one implication might involve the difficulty in teaching skills to autistic children in a classroom situation while other children are present (Koegel & Rincover, 1974).

4. The probability that autistic children show diversity in their own lives and similarly, differ one from the other emphasizes the need for more assessments of the ecological sort. It is very possible that different environmental preferences, different response classes, etc., characterize different autistic children. In the past, when most research and treatment plans with autistic children (and nonautistic children too) did not bother to assess a broad spectrum of behaviors, it is very likely that undesirable side effects did occur and were either unnoticed or unreported for lack of reliable recording of them. It is hoped that this situation becomes less common in the future.

REFERENCES

REFERENCES

Barker, R. G. Explorations in ecological psychology. American Psychologist, 1965, 20, 1-14.

Barker, R. G. Ecological psychology. Stanford: Stanford University Press, 1968.

Barker, R. G. Wanted: an eco-behavioral science. In E. P. Willems & H. L. Raush (Eds.), Naturalistic viewpoints in psychological research. New York: Holt, Rinehart and Winston, 1969.

Barker, R. G., & Wright, H. F. Midwest and its children. New York: Harper & Row, 1955.

Berlyne, D. E. Conflict, arousal, and curiosity. New York: McGraw-Hill, 1960.

Bettelheim, B. The empty fortress. New York: The Free Press, 1967.

Bucher, B., & Lovaas, O. I. Use of aversive stimulation in behavior modification. In M. R. Jones (Ed.), Miami symposium on the prediction of behavior, 1967: aversive stimulation. Coral Gables, Florida: University of Miami Press, 1968.

Creak, E. M. Psychoses in childhood. Journal of Mental Science, 1951, 97, 545-554.

Creak, E. M. Childhood psychosis: a review of 100 cases. British Journal of Psychiatry, 1963, 109, 84-89.

Cureton, E. E., Cureton, L. W., & Durfee, R. C. A method of cluster analysis. Multivariate Behavioral Research, 1970, 5, 101-116.

DeMyer, M. K., Churchill, D. W., Pontius, W., & Gilkey, K. M. A comparison of five diagnostic systems for childhood schizophrenia and infantile autism. Journal of Autism and Childhood Schizophrenia, 1971, 1, 175-189.

Eisenberg, L., & Kanner, L. Early infantile autism. American Journal of Orthopsychiatry, 1956, 26, 556-566.

Epstein, L. H., Doke, L. A., Sajwaj, T. E., Sorrell, S., & Rimmer, B. Generality and side effects of overcorrection. Journal of Applied Behavior Analysis, 1974, 7, 385-390.

Ferster, C. B. Positive reinforcement and behavioral deficits of autistic children. Child Development, 1961, 32, 437-456.

Foxx, R. M., & Azrin, N. H. The elimination of autistic self-stimulatory behaviors by overcorrection. Journal of Applied Behavior Analysis, 1973, 6, 1-14.

Freud, S. [The ego and the id.] In J. Strachey (Ed. and trans.), The standard edition of the complete psychological works of Sigmund Freud (Vol. 19). London: Hogarth, 1961. (Originally published, 1923.)

Hartshorne, H., & May, M. A. Studies in the nature of character. Vol. 1. Studies in deceit. New York: Macmillan, 1928.

Hutt, C., Hutt, S. J., Lee, D., & Ounsted, C. Arousal and childhood autism. Nature, 1964, 204, 908-909.

Hutt, S. J., Hutt, C., Lee, D., & Ounsted. C. A behavioral and electroencephalographic study of autistic children. Journal of Psychiatric Research, 1965, 3, 181-197.

Kanner, L. Autistic disturbances of affective contact. Nervous Child, 1943, 2, 217-250.

Kanner, L. Early infantile autism. Journal of Pediatrics, 1944, 25, 211-217.

Kanner, L. Irrelevant and metaphorical language in early infantile autism. American Journal of Psychiatry, 1946, 103, 242-246.

Kanner, L. To what extent is early infantile autism determined by constitutional inadequacies? In D. Hooker & C. C. Hare (Eds.), Genetics and the inheritance of integrated neurological and psychiatric patterns. Baltimore: Williams & Wilkins, 1954.

Koegel, R. L., & Covert, A. The relationship of self-stimulation to learning in autistic children. Journal of Applied Behavior Analysis, 1972, 5, 381-387.

Koegel, R. L., Firestone, P. B., Kramme, K. W., & Dunlap, G. Increasing spontaneous play by suppressing self-stimulation in autistic children. Journal of Applied Behavior Analysis, 1974, 7, 521-528.

Koegel, R. L., & Rincover, A. Treatment of psychotic children in a classroom environment: I. Learning in a large group. Journal of Applied Behavior Analysis, 1974, 7, 45-59.

Lovaas, O. I. Interaction between verbal and nonverbal behavior. Child Development, 1961, 32, 329-336.

Lovaas, O. I., Frietag, G., Kinder, M. I., Rubenstein, B. D., Schaeffer, B., & Simmons, J. Q. Establishment of social reinforcers in two schizophrenic children on the basis of food. Journal of Experimental Child Psychology, 1966, 4, 109-125.

Lovaas, O. I., Litrownik, A., & Mann, R. Response latencies to auditory stimuli in autistic children engaged in self-stimulatory behavior. Behaviour Research and Therapy, 1971, 9, 39-49.

Lovaas, O. I., & Schreibman, L. Stimulus overselectivity of autistic children in a two stimulus situation. Behaviour Research and Therapy, 1971, 9, 305-310.

Lovaas, O. I., Schreibman, L., Koegel, R., & Rehm, R. Selective responding by autistic children to multiple sensory input. Journal of Abnormal Psychology, 1971, 77, 211-222.

Lovaas, O. I., & Simmons, J. Q. Manipulation of self-destruction in three retarded children. Journal of Applied Behavior Analysis, 1969, 2, 143-157.

Mahler, M. S. On child psychosis and schizophrenia: autistic and symbiotic infantile psychoses. In R. S. Eissler, A. Freud, H. Hartmann, & E. Kris (Eds.), The psychoanalytic study of the child (Vol. VII). New York: International Universities Press, 1952.

McConnell, O. L. Control of eye contact in an autistic child. Journal of Child Psychology and Psychiatry, 1967, 8, 249-255.

Meichenbaum, D. H., Bowers, K. S., & Ross, R. R. A behavioral analysis of teacher expectancy effect. Journal of Personality and Social Psychology, 1969, 13, 306-316.

Merbaum, M. The modification of self-destructive behavior by a mother-therapist using aversive stimulation. Behavior Therapy, 1973, 4, 442-447.

Ney, P. G. Effect of contingent and non-contingent reinforcement on the behavior of an autistic child. Journal of Autism and Childhood Schizophrenia, 1973, 3, 115-127.

Nordquist, V. M. The modification of a child's enuresis: some response-response relationships. Journal of Applied Behavior Analysis, 1971, 4, 241-247.

Phillips, E. L. Contributions to a learning theory account of childhood autism. Journal of Psychology, 1957, 43, 117-124.

Rank, B. Adaptation of the psychoanalytic technique for the treatment of young children with atypical development. American Journal of Orthopsychiatry, 1949, 19, 130-139.

Raush, H. L., Farbman, I., & Llewellyn, L. G. Person, setting, and change in social interaction. II. a normal-control study. Human Relations, 1960, 13, 305-332.

Rimland, B. Infantile autism. New York: Appleton-Century-Crofts, 1964.

Risley, T. The effects and side effects of punishing the autistic behaviors of a deviant child. Journal of Applied Behavior Analysis, 1968, 1, 21-34.

Risley, T., & Wolf, M. M. Establishing functional speech in echolalic children. Behaviour Research and Therapy, 1967, 5, 73-88.

Rosenthal, R. Interpersonal expectations: effects of the experimenter's hypothesis. In R. Rosenthal & R. L. Rosnow (Eds.), Artifact in behavioral research. New York: Academic Press, 1969.

Rutter, M. Concepts of autism: a review of research. Journal of Child Psychology and Psychiatry, 1968, 9, 1-25.

Samaan, M. The control of nocturnal enuresis by operant conditioning. Journal of Behavior Therapy and Experimental Psychiatry, 1972, 3, 103-105.

Sells, S. B. Ecology and the science of psychology. In E. P. Willems & H. L. Raush (Eds.), Naturalistic viewpoints in psychological research. New York: Holt, Rinehart and Winston, 1969.

Sherman, J. A. Modification of nonverbal behavior through reinforcement of related verbal behavior. Child Development, 1964, 35, 717-723.

Tate, B. G., & Baroff, G. S. Aversive control of self-injurious behavior in a psychotic boy. Behaviour Research and Therapy, 1966, 4, 281-287.

Twardosz, S., & Sajwaj, T. Multiple effects of a procedure to increase sitting in a hyperactive retarded boy. Journal of Applied Behavior Analysis, 1972, 5, 73-78.

Wahler, R. G. Setting generality: some specific and general effects of child behavior therapy. Journal of Applied Behavior Analysis, 1969, 2, 239-246.

Wahler, R. G. Some structural aspects of deviant child behavior. Journal of Applied Behavior Analysis, 1975, 8, 27-42.

Wahler, R. G., House, A. E., & Stambaugh, E. E. Ecological assessment of child problem behavior: a clinical package for home, school and institutional settings. New York: Pergamon Press, in press.

Wahler, R. G., Sperling, K. A., Thomas, M. R., Teeter, N. C., & Luper, H. L. The modification of childhood stuttering: some response-response relationships. Journal of Experimental Child Psychology, 1970, 9, 411-428.

Ward, A. J. Early infantile autism: diagnosis, etiology, and treatment. Psychological Bulletin, 1970, 73, 350-362.

Ward, A. J. The use of structural therapy in the treatment of autistic children. Psychotherapy: Theory, Research and Practice, 1972, 9, 46-50.

Willems, E. P. Behavioral technology and behavioral ecology. Journal of Applied Behavior Analysis, 1974, 7, 151-165.

APPENDIX

Table 11

Pearson Product-Moment Correlation Matrix for the Home Setting

	C	O	O-	CP	S	OP	NI	V	US	ST	SW	Aa	Ac	SIa	SIc	SL	SA	Ia+	Ia-	Sa+	Sa-	Sc+	Sc-
C		.357	.257	.217	.236	-.272	-.304	.079	-.082	.009	.115	.217	.004	.662	-.031	-.075	-.025	.901	.481	.434	.421	-.015	-.045
O			.063	.642	.062	-.047	-.008	.196	-.293	-.133	-.030	.067	-.022	.445	.040	-.142	-.044	.411	.356	.605	.268	.021	.028
O-				.142	-.006	-.145	-.264	-.125	-.058	-.039	-.002	.249	-.092	.248	-.063	.141	.069	.309	.173	.261	.381	-.063	-.045
CP					.130	-.181	.151	.464	-.211	-.120	-.091	.136	-.022	.279	-.114	-.092	.056	.223	.357	.507	.286	-.127	-.050
S						-.225	-.333	.218	-.099	-.080	-.178	.031	-.050	.225	.091	.011	-.028	.254	.166	-.035	.118	.052	.069
OP							.118	-.088	-.018	-.339	-.034	-.046	.016	-.284	-.097	-.235	-.179	-.262	-.123	-.251	-.179	-.141	.038
NI								.176	.004	-.256	-.208	-.210	.128	-.277	-.076	-.341	-.095	-.256	-.169	-.028	-.275	-.066	-.016
V									.178	.167	-.064	-.145	-.112	.048	-.125	-.167	-.137	.047	.232	.078	.125	-.102	-.136
US										.317	.037	-.144	-.013	-.200	-.151	-.026	-.098	-.046	.087	-.373	-.135	-.073	-.159
ST											.219	-.174	-.103	-.109	-.001	.056	-.025	-.050	.005	-.219	.033	.041	-.057
SW												.035	-.095	.025	-.065	.129	.076	.038	-.068	.010	-.101	-.065	-.046
Aa													-.050	.187	-.020	.257	.214	.272	.052	.262	.191	-.006	-.076
Ac														.059	-.040	.014	.039	.043	-.081	.041	.137	.033	-.028
SIa															.209	-.162	.039	.718	.530	.679	.571	.236	-.028
SIc																-.128	-.066	.028	-.055	.082	-.058	.881	.547
SL																	.131	-.019	-.141	-.155	-.022	-.113	-.092
SA																		-.103	.071	.023	-.028	-.066	-.048
Ia+																			.401	.511	.361	.035	-.013
Ia-																				.276	.515	-.055	-.040
Sa+																					.418	.103	-.047
Sa-																						-.058	-.042
Sc+																							.122
Sc-																							

Table 12

Pearson Product-Moment Correlation Matrix for the School a.m. Setting

	C	O	O-	CP	S	OP	NI	V	US	ST	SW	Aa	Ac	SIa	SIc	SL	SA	Ia+	Ia-	Sa+	Sa-	Sc+	Sc-[a]
C		-.097	-.204	.045	-.268	-.173	-.463	-.109	.051	.132	.288	-.016	.052	.104	.210	-.006	.099	.546	.006	.314	-.037	.225	-
O			.106	-.022	-.013	-.049	.070	-.223	.865	.047	.222	.054	-.001	-.305	-.039	-.447	.130	-.425	-.133	-.222	.099	-.105	-
O-				.237	.020	.242	.036	-.034	.074	-.047	-.124	.123	.272	-.148	.529	-.261	-.148	-.114	-.219	.015	-.156	.307	-
CP					.278	.179	-.152	.648	-.244	-.080	-.116	-.185	-.038	-.184	-.007	.099	-.026	.218	-.187	.080	-.003	-.072	-
S						-.089	.252	.268	-.157	-.072	-.235	-.052	.038	-.180	-.065	-.077	-.125	-.090	-.022	-.101	.029	.081	-
OP							.115	.098	-.143	.009	-.166	.030	.180	-.274	-.097	-.210	-.442	.018	.024	-.035	.096	-.192	-
NI								-.055	.149	-.244	-.310	-.313	-.103	-.419	-.085	-.395	-.491	-.367	-.207	-.660	-.138	-.032	-
V									-.480	-.152	-.136	-.133	-.250	-.062	-.259	.297	-.099	.266	-.101	.077	-.004	-.262	-
US										-.000	.171	.066	.139	-.172	.116	-.583	.060	-.352	-.153	-.218	.035	.073	-
ST											-.004	.299	.146	-.002	-.073	-.021	.146	-.156	-.054	-.109	-.160	.003	-
SW												-.030	-.219	-.255	-.139	.017	.370	-.105	.022	.145	-.069	-.184	-
Aa													.135	.024	.115	.001	.168	-.091	.032	.200	.123	.121	-
Ac														.079	.384	-.240	-.180	-.070	-.086	-.034	.087	.477	-
SIa															-.032	.243	.355	.279	.082	.606	-.048	-.050	-
SIc																-.126	.025	.005	-.122	-.002	-.132	.838	-
SL																	.223	.213	.451	.196	.219	-.070	-
SA																		-.036	-.013	.196	-.026	.006	-
Ia+																			-.053	.360	-.096	.092	-
Ia-																				.088	.554	-.108	-
Sa+																					.035	-.137	-
Sa-																						-.062	-
Sc+																							-
Sc-																							

[a]This behavior never occurred in this setting.

Table 13

Pearson Product-Moment Correlation Matrix for the School p.m. Setting

	C	O	O-	CP	S	OP	NI	V	US	ST	SW	Aa	Ac	SIa	SIc[a]	SL	SA	Ia+	Ia-	Sa+	Sa-	Sc+	Sc-
C		.484	-.028	-.430	-.086	-.008	-.269	-.554	-.189	-.092	.357	.096	-.099	-.469	-	.528	-.040	.935	.361	-.372	.169	.230	-.180
O			.004	-.188	-.097	.072	-.261	-.252	.090	-.158	.453	.062	-.070	-.350	-	.214	-.106	.568	.450	-.368	-.059	.119	-.070
O-				.179	-.040	-.051	-.093	.106	-.064	-.027	-.147	.049	-.050	.190	-	-.065	-.012	.005	-.050	.068	-.038	-.065	-.035
CP					.013	-.396	.055	.711	.040	-.231	-.113	-.152	.059	.303	-	-.442	-.105	-.397	-.096	.206	.338	-.240	.583
S						-.327	.086	.221	.188	-.043	-.062	-.134	.163	.329	-	-.244	-.054	.008	-.094	.006	-.078	-.049	-.223
OP							.343	-.364	.202	.125	.094	.100	-.093	-.543	-	.123	-.102	-.010	.031	-.369	-.171	.132	-.197
NI								.005	.302	-.012	-.288	-.196	-.087	-.259	-	-.351	-.162	-.298	-.175	-.333	-.101	.096	-.118
V									.341	.033	-.268	-.226	.068	.519	-	-.640	.095	-.482	-.114	.220	.184	-.358	.297
US										.287	-.074	-.136	-.037	.036	-	-.552	-.194	-.138	-.016	-.507	.032	-.200	-.185
ST											-.153	-.350	-.091	.091	-	-.167	.032	-.083	-.104	-.370	-.092	-.152	-.118
SW												-.131	.007	-.231	-	.235	-.083	.378	.728	-.052	.050	.076	-.103
Aa													.084	-.160	-	.286	.124	.107	-.128	.274	-.116	-.068	-.065
Ac														-.019	-	.122	-.135	-.123	-.050	.091	-.038	.130	-.035
SIa															-	-.459	.175	-.435	-.168	.505	-.194	-.208	.282
SIc																-	-	-	-	-	-	-	-
SL																	.025	.432	.208	.022	-.122	.390	-.022
SA																		-.055	-.135	.376	-.088	-.084	.078
Ia+																			.425	-.351	.108	.054	-.149
Ia-																				-.172	-.038	.130	-.035
Sa+																					-.103	-.199	.171
Sa-																						-.049	-.026
Sc+																							-.045
Sc-																							

[a]This behavior never occurred in this setting.

VITA

Kenneth Lawrence Lichstein was born in Brooklyn, New York on July 20, 1947. He attended elementary schools in Flushing, New York, and was graduated from Flushing High School in 1964. The following September he entered the City College of New York, and in June 1968, he received a Bachelor of Business Administration degree with a major in Accounting.

The following September, he began teaching elementary school in New York City. This ended when he entered the Graduate School at The University of Tennessee in September, 1972. He received the Doctor of Philosophy degree with a major in Psychology in August 1976.

He is married to the former Betty Joan Korr of Laurelton, New York. The Lichsteins have two children, Benjamin Che, age 3, and Jeremy William, age 1-1/2.